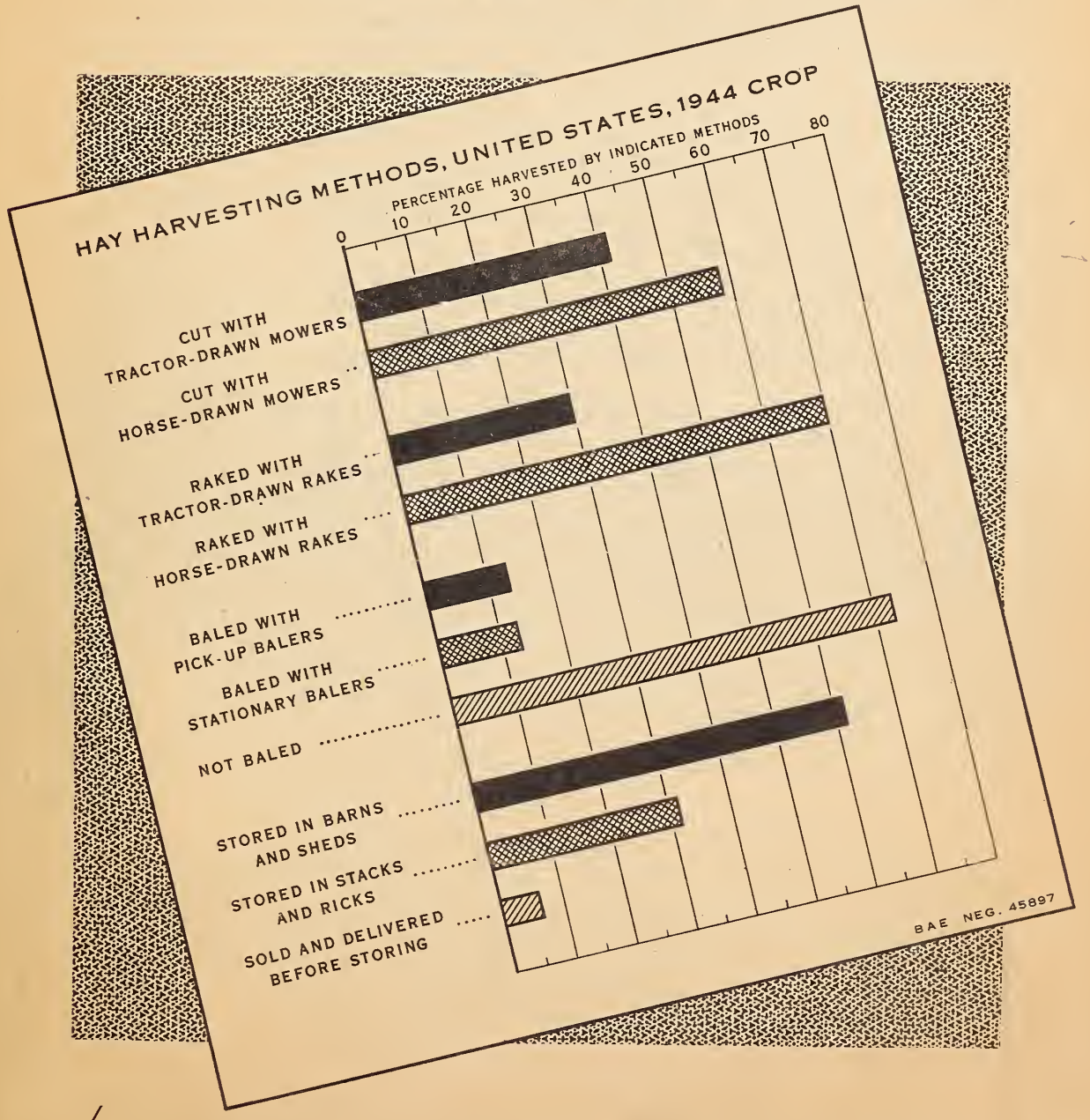
F.M. 57

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

HARVESTING THE HAY CROP



by A. P. Brodell, T. O. Engebretson, and Charles G. Carpenter

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Source of Material

This report contains information concerning haying practices and is based largely on information obtained by means of mailed questionnaires from crop correspondents. In February 1945 these correspondents furnished locality estimates applicable to their 1944 crop, concerning the relative use of machine and animal power for cutting, raking, and hauling hay, the form in which hay was sold or stored at haying time, method of storing, proportion of crop sold at haying time, and the relative use of machine and hand methods for loading and unloading. In most States information was obtained as to the proportion of the hay crops used for grass silage, quantity of hay cured on farms by barn curing methods, and the proportion of the crop stored as chopped hay.

About 20,600 reports were obtained in February 1945 and these were listed and edited in the various statistical field offices of the Bureau. The various State reports were assembled and prepared for publication largely by farm economists in the Washington office. The information in this report, relative to the 1939 crop, was obtained in February 1940. Findings of this study were summarized in the BAE mimeographed report "Machine and Hand Methods in Crop Production" (F. M.15). The inclusion of the 1939 data affords a measure of some of the changes that have since taken place in the hay harvest.

Information from the crop correspondents provides a general picture of haymaking practices in the different parts of the country. To obtain detailed information concerning these practices, 14 area studies covering the 1945 crop were initiated in cooperation with the States. In each of these studies, trained enumerators visited operators of 30 or more selected farms and obtained from them detailed information concerning the time required, and the equipment and composition of the crews used, for the different methods. In some of the area studies stress was placed on new developments in haymaking, especially barn curing. It is planned that findings of the area studies will be available in forthcoming State reports and in a summary report of the Bureau of Agricultural Economics.

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By A. P. Brodell, Agricultural Economist, T. O. Engebretson, Agricultural Economist, and Charles G. Carpenter, Agricultural Statistician

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PRELIMINARY

Hay is an important crop. In recent years the acreage harvested for hay excluding peanut hay, has usually exceeded 67 million acres. This is usually greater than the acreage of any other crop except corn. In 1939 hay was produced on more than 3.4 million farms or on about 56 percent of all farms. The value of the 1944 hay crop was about 1.6 billion dollars and was exceeded in value only by corn.

For preparing the seedbed, for seeding, and for performing other operations concerned with growing and harvesting the various hays it is estimated that an average of about 12 hours of man labor per acre are utilized. This is less labor per acre than is required for any other major crop except the small grains.

Although per acre labor needs are relatively low, the hay-harvesting season is an extremely busy one in the major hay areas because 80 percent or more of the year's labor needs for hay are necessary during the harvest and because of the competition from other crops. Timeliness during harvest is even more important than in the case of most crops. For high-quality hay the crop must be cut at the proper stage of maturity and stored as soon as sufficiently cured.

Delayed cutting and an extended harvest, whether due to labor shortages or adverse weather, mean losses in quality as well as in quantity. Farmers in 1944 had comparatively few workers for the hay harvest and, compared with workers in prewar years, many were either relatively young or relatively old. Thus a high proportion of these workers lacked the physical stamina of the prewar workers.

Although farm wage rates in 1944 were about 150 percent above 1939, critical shortage of labor at haying time prevailed in many areas. Since 1939, the farm-wage rates have increased much more than have the prices of farm machines and the cost of custom work. Thus conditions in 1944 favored an extensive use of labor-saving machines for harvesting the crop. Production of important hay-harvest machines was relatively high during the war years and farmers used these labor-saving machines more hours per year than was the case in the prewar years.

ACREAGE AND PRODUCTION

The harvested acreage of hay crops in 1944, exclusive of peanut hay, was only about 5 percent above average but as the growing conditions were better than average, the production was about 11 percent above average (table 1).

Hay production is distributed widely throughout the country but the areas of heavy production are in the Northern half of the country and along the Pacific Coast where cattle numbers are relatively large and dairy production is usually important. In most of the Southern States the acreage is small in relation to the area from which crops are harvested, and the hay yield per acre is below the average of the country.

CUTTING AND RAKING

Mowers drawn by work animals were used for cutting 58 percent of the 1944 crop and about 85 percent of the 1939 crop (table 2). In 1944 tractor mowers cut nearly three times as much hay as in 1939. Use of tractor mowers has increased in all parts of the country, and in 1944 more than half of the hay in the Pacific Coast States, Oklahoma and Texas, most Mountain States and in some Great Plains and Northeast States, was cut with tractor mowers. In some areas, especially in the West, more than 75 percent of the hay was cut with tractor mowers (fig. 1). But horse-drawn mowers cut 75 percent, or more, of the hay crop in the Delta States, the Appalachian and the Southeastern States. In the Lake States and the Northeastern States use of the horse-drawn mowers was above the United States average.

Table 1.- Acreage and production of hay, by States and by State groups, 1934-43 average and 1944

State and group	Area harvested for hay 1/		Hay production 1/	
	Average 1934-43	1944	Average 1934-43	1944
	1,000 acres	1,000 acres	1,000 tons	1,000 tons
Maine	909	886	814	755
New Hampshire	356	345	392	360
Vermont	899	889	1,084	992
Massachusetts	361	352	512	412
Rhode Island	37	34	49	38
Connecticut	295	286	413	315
New York	5,976	5,970	5,227	5,733
New Jersey	242	248	375	339
Pennsylvania	2,337	2,250	3,060	3,233
Delaware	68	82	88	97
Maryland	404	426	517	489
Northeast	9,882	9,766	12,551	12,741
Ohio	2,490	2,358	3,528	3,298
Indiana	1,968	1,939	2,514	2,440
Illinois	2,805	2,625	3,619	3,508
Iowa	3,488	3,415	5,108	5,882
Missouri	2,978	3,317	3,091	3,657
Corn Belt	13,729	13,652	17,660	18,785
Michigan	2,634	2,613	3,453	3,443
Wisconsin	3,785	4,113	6,063	6,736
Minnesota	4,328	4,310	5,880	6,172
Lake States	10,747	11,036	15,396	16,351
North Dakota	2,702	2,814	2,472	3,121
South Dakota	2,561	3,575	1,923	3,457
Nebraska	3,711	4,311	3,222	4,902
Kansas	1,498	1,594	1,875	2,767
Great Plains	10,472	12,294	9,492	14,247
West Virginia	717	795	784	823
Kentucky	1,472	1,576	1,707	1,623
Tennessee	1,907	1,919	2,017	1,619
Appalachian	4,096	4,288	4,508	4,065
Virginia	1,051	1,217	1,180	1,291
North Carolina	879	984	885	993
South Carolina	591	544	425	397
Georgia	556	459	428	350
Florida	32	22	24	16
Alabama	656	642	565	520
Southeast	3,765	3,868	3,505	3,547
Mississippi	857	944	980	1,120
Louisiana	302	308	366	379
Arkansas	1,171	1,351	1,211	1,419
Delta	2,310	2,603	2,557	2,918
Oklahoma	1,060	1,229	1,258	1,821
Texas	957	1,019	1,101	1,351
Oklahoma-Texas	2,017	2,248	2,359	3,172
Montana	1,819	1,892	2,094	2,435
Idaho	1,138	1,155	2,519	2,293
Wyoming	965	990	1,090	1,086
Colorado	1,384	1,459	2,007	2,279
New Mexico	186	220	369	478
Arizona	230	327	544	785
Utah	558	591	1,079	1,234
Nevada	382	409	576	611
Mountain	6,662	7,003	10,078	11,199
Washington	960	1,046	1,792	1,966
Oregon	1,096	1,090	1,836	1,862
California	1,798	2,014	4,830	5,588
Pacific	3,854	4,150	8,458	9,416
United States	67,534	70,908	86,544	96,441

1/ Does not include acres or production of peanut hay.

Table 2.- Extent of use of tractor power and animal power for cutting hay in 1939 and 1944, for raking hay in 1944, and times alfalfa is cut annually by States

State and group	Percentage of hay production cut 1/				Percentage of 1944 hay production raked with		Average times alfalfa is cut annually
	In 1939		In 1944				
	With tractor mowers	With horse-drawn mowers	With tractor mowers	With horse-drawn mowers	Tractor-drawn dump and side-delivery rakes	Horse-drawn dump and side-delivery rakes	
	Percent	Percent	Percent	Percent	Percent	Percent	Number
Maine	26	74	41	59	34	66	1.9
New Hampshire	29	71	53	47	38	62	2.1
Vermont	11	89	29	71	19	81	2.2
Massachusetts	29	71	54	46	46	54	2.0
Rhode Island	36	64	67	33	50	50	2.4
Connecticut	31	69	54	46	41	59	2.3
New York	14	86	32	68	27	73	2.0
New Jersey	26	74	61	39	57	43	2.6
Pennsylvania	14	86	35	65	31	69	2.6
Delaware	16	84	34	66	22	78	2.9
Maryland	11	89	34	66	24	76	2.7
Northeast	17	83	36	64	30	70	2.2
Ohio	9	91	39	61	36	64	2.8
Indiana	13	87	46	54	43	57	2.7
Illinois	15	85	49	51	44	56	2.8
Iowa	14	86	42	58	36	64	2.7
Missouri	10	90	35	65	22	78	3.2
Corn Belt	12	88	42	58	35	65	2.8
Michigan	14	86	43	57	40	60	2.0
Wisconsin	9	91	20	80	19	81	2.0
Minnesota	11	89	33	67	20	80	2.3
Lake States	11	89	30	70	25	75	2.1
North Dakota	11	89	48	52	24	76	1.7
South Dakota	25	75	55	45	30	70	2.3
Nebraska	30	70	46	54	19	81	3.0
Kansas	26	74	55	45	35	65	3.3
Great Plains	23	77	50	50	26	74	2.9
West Virginia	4	96	10	90	6	94	2.6
Kentucky	6	94	16	84	8	92	3.0
Tennessee	5	95	13	87	6	94	3.3
Appalachian	5	95	14	86	7	93	3.0
Virginia	7	93	17	83	8	92	3.1
North Carolina	4	96	17	83	6	94	2.9
South Carolina	8	92	22	78	7	93	2.9
Georgia	8	92	25	75	12	88	2.9
Florida	16	84	42	58	32	68	—
Alabama	11	89	18	82	8	92	3.0
Southeast	7	93	19	81	8	92	3.1
Mississippi	12	88	23	77	12	88	3.2
Louisiana	8	92	26	74	16	84	3.7
Arkansas	8	92	19	81	9	91	3.3
Delta	9	91	21	79	11	89	3.3
Oklahoma	25	75	72	28	56	44	3.3
Texas	19	81	64	36	46	54	3.2
Oklahoma-Texas	22	78	68	32	51	49	3.3
Montana	15	85	59	41	32	68	2.0
Idaho	16	84	48	52	18	82	2.4
Wyoming	24	76	61	39	30	70	2.0
Colorado	24	76	55	45	29	71	2.6
New Mexico	18	82	64	36	48	52	3.5
Arizona	46	54	70	30	61	39	4.4
Utah	11	89	34	66	12	88	2.7
Nevada	10	90	43	57	32	68	2.1
Mountain	19	81	54	46	29	71	2.5
Washington	19	81	61	39	46	54	2.3
Oregon	22	78	58	42	44	56	2.4
California	34	66	72	28	56	44	4.8
Pacific	28	72	66	34	51	49	3.9
United States	15	85	42	58	30	70	2.7

1/ Data apply to all hay exclusive of peanut hay.

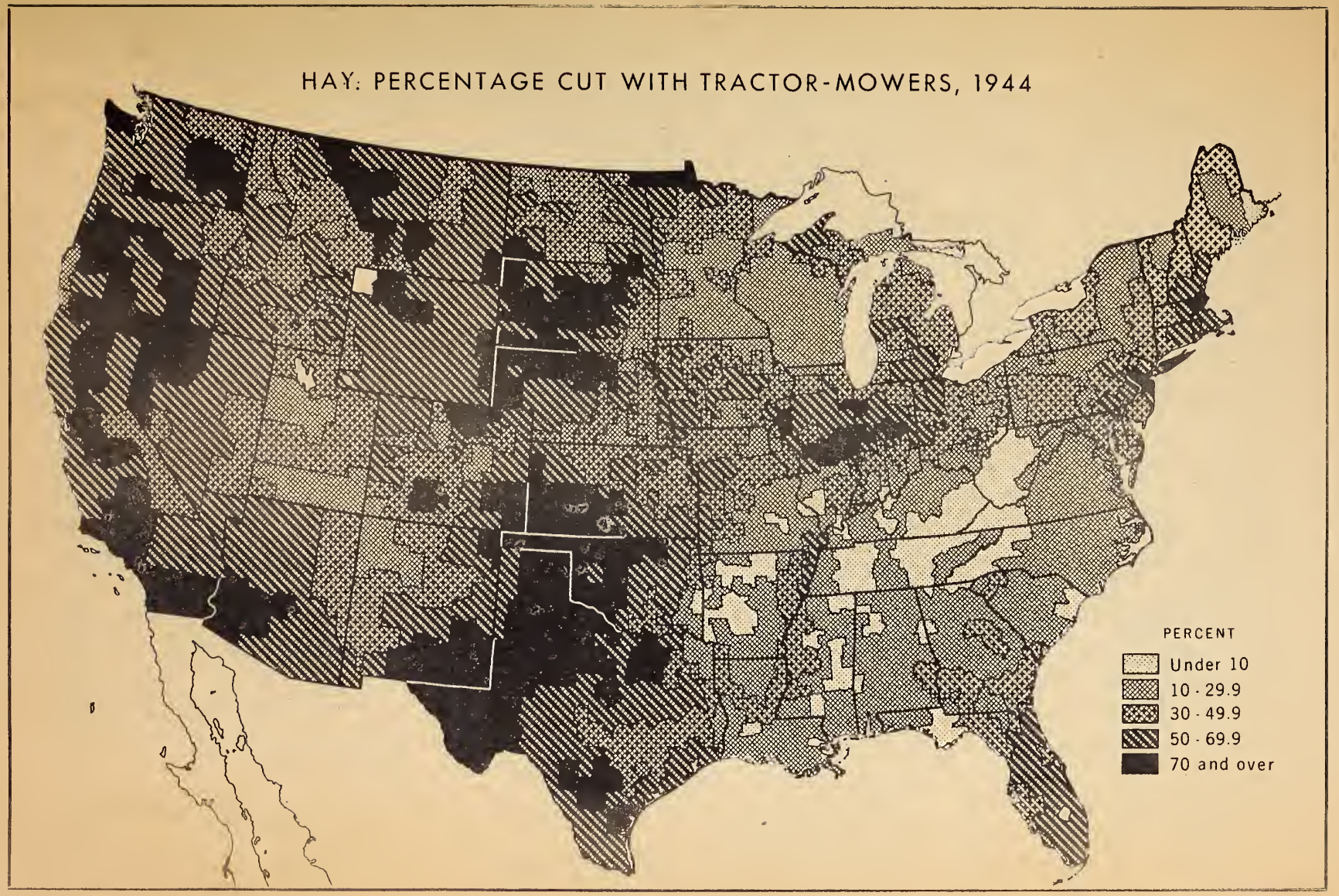
HAY: PERCENTAGE CUT WITH TRACTOR-MOWERS, 1944
PERCENT
Under 10
10 - 29.9
30 - 49.9
50 - 69.9
70 and over
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FIGURE 1

In 1944 about 14.5 million acres of the harvested hay crops were alfalfa. The average number of times alfalfa is usually cut annually is about 2.7 times for the entire country. Number of cuttings ranges from 1 to about 7 in different parts of the country. Length of growing season, amount of moisture, and soil productivity, all influence the number of cuttings. The highest number of cuttings was reported in the irrigated areas of the Southwest and the fewest cuttings were in the subhumid areas of the Mountain and Northern Plains States (fig. 2).

Other hay crops, especially the clovers in some areas, are cut twice annually. Mowers are also used for cutting weeds in pastures, in fields, along roadsides, and for mowing sod orchards.

Probably the total area cut once over with mowers is twice as large as the area harvested for hay. In 1944 the area cut once over with tractor mowers was probably about 60 million acres. Labor for cutting with tractor mowers, according to a study made in 1941, averaged 0.51 hours per acre and 1.18 hours per acre for horse-drawn mowers. 1/ In 1944 the use of tractor mowers probably effected a saving of about 40 million hours of man labor, and the cutting was done more rapidly and more nearly at the desired time.

Raking the hay is lighter work than the cutting, and on many farms dump rakes can be operated to better advantage with teams than with tractors. In all areas, in 1944, animal power was used to a greater extent for raking than for cutting hay. Dump and side-delivery rakes drawn by work animals were used for about 70 percent of the raking in 1944 (table 2). In the Appalachian, the Delta, and the Southeast States 89 percent or more of the hay was raked with animal-drawn rakes (fig. 3 and table 2).

HAULING

Estimates relative to the extent that animal and mechanical power was used for hauling hay to stacks or barns are provided by the 1939 study. It did not supply information concerning the kind of power used for hauling to market at haying time or the extent to which different kinds of mechanical power were used for hauling at haying time. From 1939 to 1944 there was a marked increase in the use of machine power for hauling hay at haying time. In 1939 about 85 percent of the hay stored in barns and stacks was transported at haying time with animal power. In 1944, animal-drawn wagons, sleds and buck rakes were used to move about 55 percent of the total crop at haying time, including that

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1/ "Work Performed with Principal Farm Machines," BAE, U. S. Department of Agriculture (F.M. 42). (Mimeographed.)

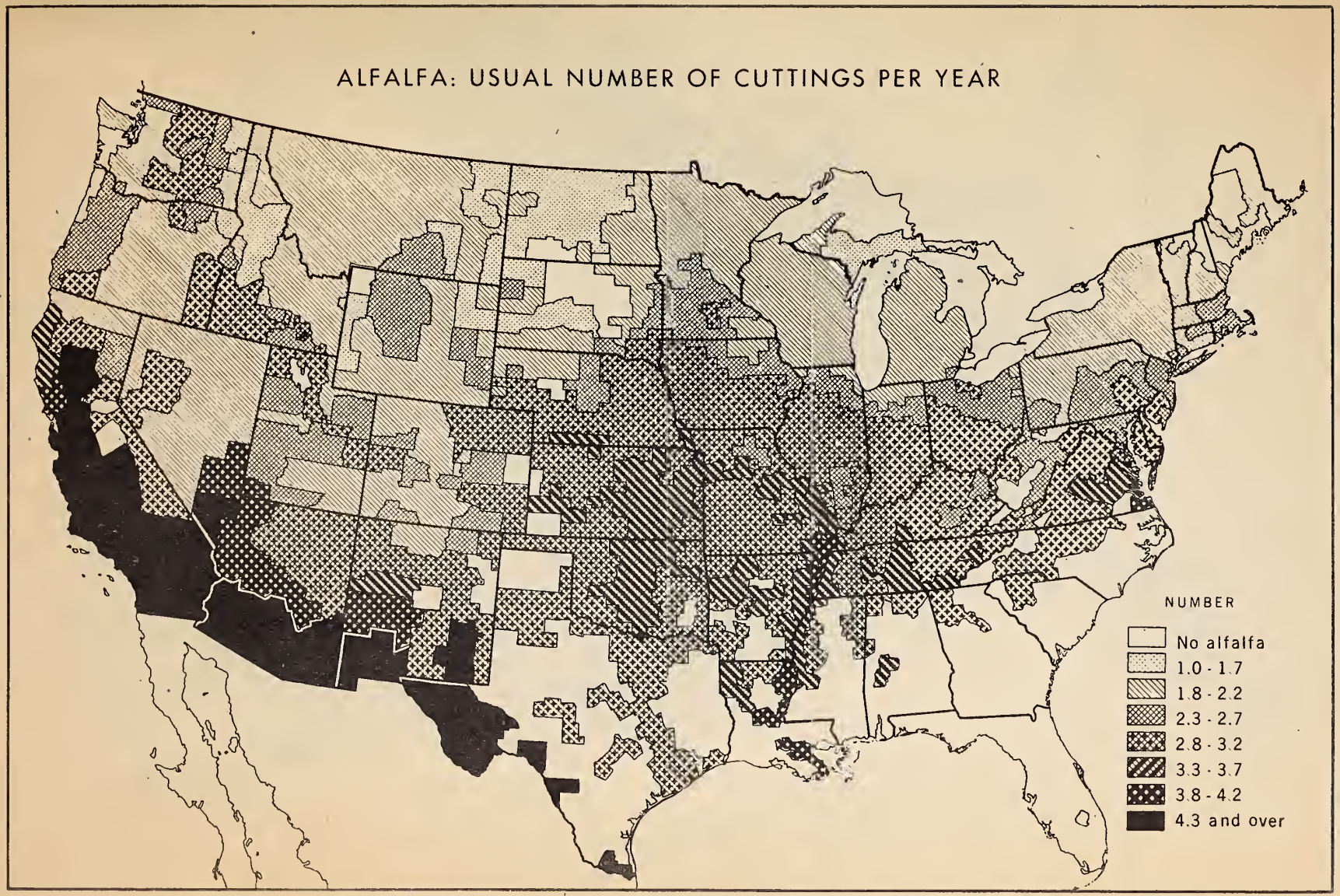
ALFALFA: USUAL NUMBER OF CUTTINGS PER YEAR
NUMBER
No alfalfa
1.0 - 1.7
1.8 - 2.2
2.3 - 2.7
2.8 - 3.2
3.3 - 3.7
3.8 - 4.2
4.3 and over
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FIGURE 2

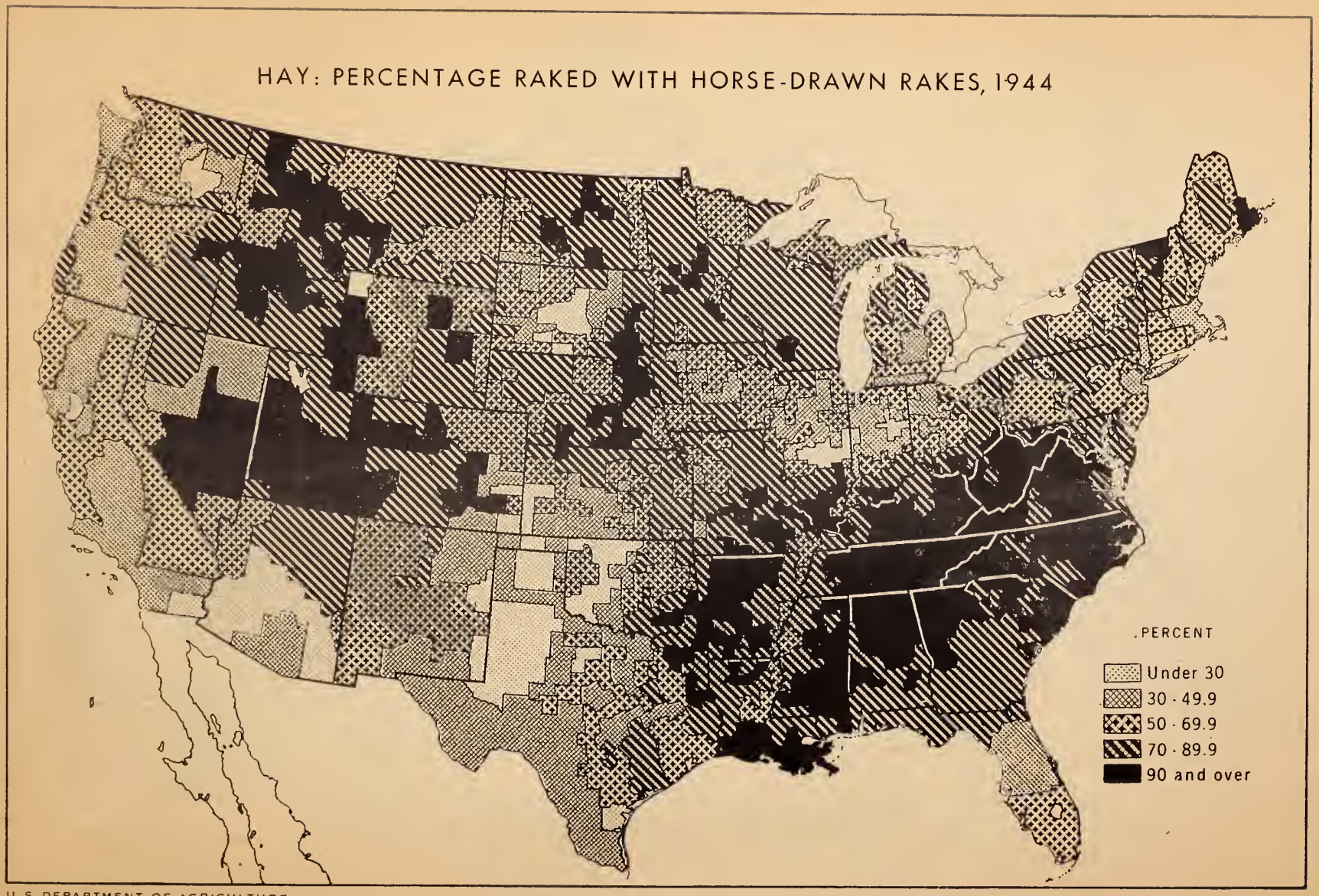
HAY: PERCENTAGE RAKED WITH HORSE-DRAWN RAKES, 1944
PERCENT
Under 30
30 - 49.9
50 - 69.9
70 - 89.9
90 and over
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FIGURE 3

sold. Wagons and sleds drawn by teams were used to haul about 45 percent of the crop, while buck rakes operated by animal power accounted for about 10 percent of the 1944 crop. About 20 percent of the 1944 crop was hauled on tractor-drawn sleds, wagons, and other vehicles, with motortrucks and mechanical-powered buck rakes each accounting for about one-eighth of the crop.

When the haul is short and when stackers, power forks, or other mechanical devices for storing are available, the buck rake provides an effective labor-saving method for hauling to farm storage. Taken together, buck rakes operated with teams and with mechanical power, accounted for about 22 percent of the crop hauled at haying time. Use of buck rakes for transporting hay was most pronounced in the Great Plains and the Mountain States where much of the crop is stored in stacks and ricks at haying time (tables 3 and 7).

In most Eastern areas the use of buck rakes in hay-making is a recent development. In 1944, for hauling hay to farm storage buck rakes were used for about 14 percent of the crop in the Corn Belt and for less than 5 percent in the Northeast States and Appalachian States.

Use of tractor-drawn sleds, wagons, and other vehicles for transporting hay at haying time was above the average of the country in the Corn Belt, the Lake States, and the Northeast States, where the use of hay loaders and other mechanical devices for loading hay in fields is also above average (table 4). The use of tractor power for transporting hay in Texas and Oklahoma was also above the national average.

The use of motortrucks at haying time for hauling to farm storage and market was above average in the Pacific Coast States, Arizona, New Mexico, and in Oklahoma and Texas where a relatively high proportion of the crop was baled at haying time and the proportion of the crop sold before storing was above the average. In the New England States and in New Jersey and Maryland the use of motortrucks for hauling hay was above the average.

LOADING AND UNLOADING

About 22 percent of the total crop was hauled at haying time with buck rakes drawn with teams or with mechanical power. No information was obtained concerning the methods used in handling this hay after it was brought to stacks or barns. It seems probable, however, that practically all of it was placed on stacks with stackers or in barns with power forks or other mechanical storing devices. Use of buck rakes was most pronounced in the Western areas where stackers are in common use. In the more humid areas buck rakes are usually found on farms where the hay acreage is large and the barns are usually well equipped with mechanical storing devices.

Table 3.- Use of mechanical and animal power for hauling hay at haying time, by States, 1939 and 1944 crops

State and group	Percentage of 1939 hay production that was hauled from fields to barns, or stacks, with 1/: Work-stock	Tractors and motor-trucks	Percentage of 1944 hay production that was hauled at haying time to barns, stacks, or market with 2/: Horse buck rakes 3/	Auto or tractor buck rakes 3/	Wagons, sleds, etc., drawn by work animals	Wagons, sleds, etc., drawn by tractors	Motor-trucks
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Maine	72	28	.6	2.0	49.2	16.2	32.0
New Hampshire	70	30	.2	3.0	44.0	15.0	37.8
Vermont	83	17	.9	1.6	63.5	11.2	22.8
Massachusetts	64	36	.6	2.6	38.0	19.8	39.0
Rhode Island	61	39	.7	2.6	28.2	8.9	59.6
Connecticut	58	42	—	2.3	31.4	11.5	54.8
New York	81	19	.8	3.0	57.3	24.7	14.2
New Jersey	62	38	1.4	4.2	23.2	20.9	50.3
Pennsylvania	80	20	1.6	3.0	54.5	31.7	9.2
Delaware	78	22	1.5	2.0	61.9	17.9	16.7
Maryland	84	16	1.8	1.8	52.4	20.0	24.0
Northeast	78	22	1.0	2.8	53.8	23.8	18.6
Ohio	84	16	1.6	10.9	52.8	29.2	5.5
Indiana	87	13	1.8	8.7	50.3	29.2	10.0
Illinois	87	13	4.0	4.0	41.7	36.6	13.7
Iowa	79	21	3.9	9.9	40.8	41.9	3.5
Missouri	95	5	15.7	6.6	56.9	10.6	10.2
Corn Belt	86	14	5.5	8.2	47.5	30.9	7.9
Michigan	88	12	1.2	4.8	49.6	35.2	9.2
Wisconsin	86	14	1.4	3.0	63.5	27.5	4.6
Minnesota	86	14	15.7	15.2	44.0	22.0	3.1
Lake States	86	14	6.7	8.0	53.2	27.1	5.0
North Dakota	93	7	30.4	33.4	23.7	8.6	3.9
South Dakota	88	12	33.1	38.4	17.3	8.7	2.5
Nebraska	86	14	31.5	36.3	21.0	6.8	4.4
Kansas	82	18	15.3	17.9	32.3	16.9	17.6
Great Plains	88	12	28.5	32.6	22.9	9.6	6.4
West Virginia	94	6	.3	.1	87.0	5.6	7.0
Kentucky	95	5	5.4	1.0	80.0	5.2	8.4
Tennessee	98	2	3.7	1.2	83.4	6.1	5.6
Appalachian	96	4	3.7	.9	82.8	5.6	7.0
Virginia	94	6	3.7	1.5	80.8	5.0	9.0
North Carolina	96	4	3.5	1.9	77.8	8.7	8.1
South Carolina	97	3	6.6	2.1	77.4	5.5	8.4
Georgia	97	3	4.5	2.7	76.1	8.3	8.4
Florida	84	16	3.4	2.8	61.2	8.7	23.9
Alabama	96	4	5.2	1.0	80.5	4.8	8.5
Southeast	96	4	4.3	1.7	79.0	6.4	8.6
Mississippi	94	6	8.3	3.9	67.0	9.6	11.2
Louisiana	94	6	4.7	2.4	75.0	6.9	11.0
Arkansas	95	5	6.7	3.1	74.8	4.5	10.9
Delta	94	6	7.1	3.5	71.8	6.8	11.0
Oklahoma	79	21	8.2	6.9	23.0	22.6	39.3
Texas	82	18	6.4	7.2	32.2	26.0	28.2
Oklahoma-Texas	81	19	7.4	7.0	26.9	24.1	34.6
Montana	89	11	27.3	43.8	15.9	5.2	7.8
Idaho	93	7	10.7	13.5	58.3	11.5	6.0
Wyoming	90	10	39.9	45.4	10.3	1.8	2.6
Colorado	85	15	21.4	33.7	27.6	12.0	5.3
New Mexico	76	24	3.0	6.7	39.6	19.6	31.1
Arizona	62	38	4.9	.5	23.2	18.4	53.0
Utah	89	11	10.5	3.6	64.2	7.9	13.8
Nevada	96	4	53.6	2.8	31.4	8.8	3.4
Mountain	88	12	20.9	24.4	34.1	9.6	11.0
Washington	77	23	5.2	9.6	33.3	22.5	29.4
Oregon	84	16	6.9	8.9	40.2	20.9	23.1
California	62	38	3.2	7.5	21.5	13.2	54.6
Pacific	70	30	4.3	8.2	27.7	16.7	43.1
United States	85	15	10.2	12.2	44.8	19.4	13.4

1/ Data based on all hay including peanut hay.
2/ Data based on all hay exclusive of peanut hay.
3/ Includes small quantities of hay moved to stacks or barns with dump rakes and other mechanical devices. In some localities buck rakes are called sweep rakes, push rakes, go-devils, etc.

Table 4.- Extent of use of mechanical and hand methods for loading and unloading loose and baled hay at haying time, 1944 crop

State and group	Hay production 1/	Hauled with buck rakes and other rakes	Hauled with sleds, wagons, motortrucks and other vehicles		Unloaded at barns, stacks, or local markets	
			Loaded by hand methods	Loaded with hay loaders and other devices	By hand methods	With power forks, sling stackers and other mechanical devices 2/
	1,000 tons	Percent	Percent	Percent	Percent	Percent
Maine	735	2.6	75.9	21.5	11.7	88.3
New Hampshire	360	5.2	66.8	30.0	45.6	54.4
Vermont	992	2.5	55.5	42.0	39.0	61.0
Massachusetts	412	3.2	57.0	39.8	29.1	70.9
Rhode Island	38	3.5	62.9	33.8	36.8	63.2
Connecticut	315	2.3	66.4	31.3	37.1	62.9
New York	5,755	5.8	29.8	66.4	12.5	87.5
New Jersey	339	5.6	42.5	51.9	27.4	72.6
Pennsylvania	5,235	4.6	41.0	54.4	12.4	87.6
Delaware	97	3.5	54.0	42.5	44.3	55.7
Maryland	489	3.6	49.2	47.2	27.0	73.0
Northeast	12,741	3.8	41.4	54.8	18.3	81.7
Ohio	3,298	12.5	28.0	59.5	8.8	91.2
Indiana	2,440	10.5	41.2	48.3	10.7	89.3
Illinois	3,508	8.0	47.8	44.2	19.3	80.7
Iowa	5,882	13.8	13.8	72.4	6.9	93.1
Missouri	3,657	22.3	66.1	11.6	28.0	72.0
Corn Belt	18,785	13.7	36.2	50.1	13.8	86.2
Michigan	3,443	6.0	19.8	74.2	7.5	92.5
Wisconsin	6,736	4.4	17.2	78.4	5.7	94.3
Minnesota	6,172	30.9	29.7	39.4	13.8	86.2
Lake States	16,351	14.7	22.2	63.1	9.4	90.6
North Dakota	3,121	63.8	29.7	6.5	14.1	85.9
South Dakota	3,457	71.5	21.4	7.1	9.7	90.3
Nebraska	4,902	67.8	22.9	9.3	14.2	85.8
Kansas	2,767	33.2	50.7	16.1	34.7	65.3
Great Plains	14,247	61.1	29.6	9.3	17.1	82.9
West Virginia	823	.4	93.7	5.9	72.8	27.2
Kentucky	1,623	6.4	89.8	3.8	73.0	27.0
Tennessee	1,619	4.9	90.4	4.7	57.1	42.9
Appalachian	4,065	4.6	90.7	4.7	66.8	33.2
Virginia	1,291	5.2	83.4	11.4	60.7	39.3
North Carolina	993	5.4	91.8	2.8	86.0	14.0
South Carolina	397	8.7	89.5	1.8	86.6	13.4
Georgia	550	7.2	91.0	1.8	86.4	13.6
Florida	16	6.2	87.5	6.3	75.0	25.0
Alabama	520	6.2	90.9	2.9	86.3	13.7
Southeast	3,547	6.0	88.4	5.6	77.1	22.9
Mississippi	1,120	12.2	86.0	1.8	75.4	24.6
Louisiana	579	7.1	90.0	2.9	85.5	14.5
Arkansas	1,419	9.8	87.5	2.7	78.5	21.5
Delta	2,918	10.4	86.9	2.7	78.0	22.0
Oklahoma	1,821	15.1	80.7	4.2	73.9	26.1
Texas	1,351	13.6	83.8	2.6	78.6	21.4
Oklahoma-Texas	3,172	14.4	82.1	3.5	76.1	23.9
Montana	2,433	71.1	21.4	7.5	13.3	86.7
Idaho	2,293	24.2	68.2	7.6	9.9	90.1
Wyoming	1,086	85.3	8.8	5.9	8.8	91.2
Colorado	2,279	55.1	37.3	7.6	23.3	76.7
New Mexico	478	9.7	82.1	8.2	74.1	25.9
Arizona	785	5.4	82.2	12.4	85.2	14.8
Utah	1,254	14.1	78.2	7.7	17.2	82.8
Nevada	611	56.4	25.8	17.8	12.1	87.9
Mountain	11,199	45.3	46.5	8.2	21.3	78.7
Washington	1,966	14.8	69.0	16.2	21.3	78.7
Oregon	1,862	15.8	72.4	11.8	15.1	84.9
California	5,588	10.7	64.3	25.0	43.8	56.2
Pacific	9,416	12.5	66.5	21.0	33.3	66.7
United States	96,441	22.4	45.0	32.6	25.5	74.5

1/ See table 1, footnote 1.

2/ Includes all hay hauled to farm storage with buck rakes. No information was obtained from growers concerning the method of handling hay delivered to farm storage by buckrakes but it is believed that practically all of this hay was stored or stacked with power forks, slings, stackers or other mechanical devices.

Of the crop hauled at haying time about 45 percent was loaded on wagons, sleds, motortrucks, and other vehicles by hand. Loading by hand was most pronounced in the Southern, the Appalachian and the Western areas. In Michigan and Wisconsin about three-fourths of the crop hauled at haying time was loaded by hay loaders and other mechanical devices. Use of loaders and other mechanical devices for field loading was also above average in the Corn Belt and in the Northeastern States. Although 45 percent of the 1944 crop hauled at haying time was loaded by hand, almost three-fourths was stored with power forks, slings, or other mechanical storing devices (table 4).

Use of mechanical devices for storing hay was above the average in the Lake States, the Corn Belt, Great Plains, and in the Northeast States. Hand methods for storing generally prevailed in Oklahoma-Texas, the Delta States, the Appalachian States, and in the Southeast.

The crop correspondents were not requested to supply specific information concerning the proportion of the 1944 hay crop hauled or baled at haying time from the windrow, the shock or cock, the swath, or the small amount loaded direct from the cutter bar and cured in artificial curing plants. But the information supplied by crop correspondents indicates that the bulk of the crop was hauled or baled from the windrow.

Practically all of the hay baled with windrow pick-up balers and that moved to farm storage with buck rakes as well as the hay loaded in fields at haying time with hay loaders and other mechanical devices was from the windrow. Also, in many areas much of the hay baled at haying time with stationary balers was taken direct from the windrow. If 75 percent of this hay and all the hay baled with windrow pick-up balers was from the windrow, as well as that loaded with hay loaders and moved with buck rakes, then it seems likely that about 75 percent of the 1944 crop was baled or hauled at haying time from the windrow.

It appears that about 90 percent of the hay in the Corn Belt and Lake States, about 80 percent in the Great Plains, about 75 percent in the Pacific States, about 70 percent in the Northeast States, the Mountain States, and Oklahoma and Texas, more than 35 percent in the Delta States and about 25 percent in the Appalachian and Southeast States was baled or hauled at haying time from the windrow.

Practically all of the hay not handled at haying time from the windrow was shocked or bunched before hauling or baling. Small quantities in areas where hay loaders are in common use were loaded

from the swath and still smaller quantities of hay were loaded green direct from the cutter-bar.

LOOSE LONG HAY AND CHOPPED HAY

More than three-fourths of the 1944 crop was stored or sold at haying time as loose long hay (table 5). In the New England States, Wisconsin, Minnesota, the Dakotas, Montana, Wyoming, Colorado, Virginia, and West Virginia, more than 90 percent of the 1944 crop was stored or sold in this way. The quantity of hay sold at haying time in each of these States, except Colorado, was below the average (table 7).

Chopped hay is still of small importance but the use of hay choppers has been increasing in recent years. Chopping hay effects a saving of about 50 percent in storage space, compared with loose long hay, if the storage building is strong enough to carry the additional load. When blowers are available, chopped hay can be stored more uniformly and with less labor than baled or loose long hay.

Information concerning the quantity of hay chopped was not obtained in most Southern and Appalachian States where the quantity of hay chopped is believed to be below the United States average. For the States reporting, about 2 percent of the 1944 hay crop was stored as chopped hay. This kind of storing was most important in the Pacific Coast States and in Idaho; there this method accounted for from 7 to 12 percent of the 1944 crop. No information was obtained concerning the proportion of the hay stored as long hay that was chopped before it was fed or sold, but it is believed that considerable hay, especially in the Pacific Coast States, the Mountain States, and Great Plains, is stored as long hay and chopped before being fed.

BALED HAY

An important and marked wartime trend in haymaking has been the increase in the baling of hay. In 1944 about 27 percent of the crop was baled as compared with 14.5 percent in 1939 (table 6). Increases in baling from 1939 to 1944 were reported in all parts of the country except in the Southeast States. There the 1939 and 1944 data are not comparable because peanut hay, which is mostly baled, was included in the 1939 estimates and was excluded in the 1944 estimates.

Increases in baling from 1939 to 1944 were below the average of the country in California, and in Oklahoma and Texas where baling hay was well established in 1939.

Table 5.- Percentage of hay stored as baled hay, loose long hay, and chopped hay, and sold at haying time by States, 1944 crop

State and group	Hay production 1944 1/	Hay sold or stored at haying time as -		
		Baled hay	Loose long hay	Chopped hay
	1,000 tons	Percent	Percent	Percent
Maine	735	.9	98.8	.3
New Hampshire	360	2.2	96.9	.9
Vermont	992	1.3	98.2	.5
Massachusetts	412	5.2	93.6	1.2
Rhode Island	38	1.7	97.3	1.0
Connecticut	313	4.9	93.1	2.0
New York	5,733	10.6	87.9	1.5
New Jersey	339	32.6	66.5	.9
Pennsylvania	3,233	12.4	86.8	.8
Delaware	97	23.8	75.1	1.1
Maryland	489	21.4	78.0	.6
Northeast	12,741	10.3	88.6	1.1
Ohio	3,298	23.4	75.7	.9
Indiana	2,440	35.9	61.7	2.4
Illinois	3,508	44.2	54.5	1.3
Iowa	5,882	25.3	73.2	1.5
Missouri	3,657	32.6	66.6	.8
Corn Belt	18,785	31.3	67.4	1.3
Michigan	3,443	14.2	84.8	1.0
Wisconsin	6,736	8.0	90.6	1.4
Minnesota	6,172	8.2	91.1	.7
Lake States	16,351	9.4	89.6	1.0
North Dakota	3,121	1.0	98.7	.3
South Dakota	3,457	3.8	95.7	.5
Nebraska	4,902	10.7	88.6	.7
Kansas	2,767	36.0	62.2	1.8
Great Plains	14,247	11.8	87.4	.8
West Virginia	823	.8	98.8	.4
Kentucky	1,623	33.4	66.6	2/
Tennessee	1,619	23.4	76.6	2/
Appalachian	4,065	22.8	77.0	-
Virginia	1,291	8.0	92.0	2/
North Carolina	993	19.6	80.3	.1
South Carolina	397	18.5	81.5	2/
Georgia	330	18.4	81.6	2/
Florida	16	22.2	77.8	2/
Alabama	520	24.0	76.0	2/
Southeast	3,547	15.8	84.2	-
Mississippi	1,120	26.5	73.5	2/
Louisiana	379	31.5	68.5	2/
Arkansas	1,419	36.7	63.3	2/
Delta	2,918	32.1	67.9	-
Oklahoma	1,821	60.6	39.4	2/
Texas	1,351	61.7	38.3	2/
Oklahoma-Texas	3,172	61.1	38.9	-
Montana	2,433	3.8	94.5	1.7
Idaho	2,293	8.2	84.7	7.1
Wyoming	1,086	4.9	95.0	.1
Colorado	2,279	5.8	92.7	1.5
New Mexico	478	45.7	53.3	1.0
Arizona	785	76.7	21.3	2.0
Utah	1,234	18.1	78.8	3.1
Nevada	611	28.4	67.3	4.3
Mountain	11,199	15.0	82.1	2.9
Washington	1,966	15.9	71.6	12.5
Oregon	1,862	23.0	69.3	7.7
California	5,588	53.0	40.3	6.7
Pacific	9,416	39.3	52.6	8.1
United States	96,441	20.9	77.1	3/ 2.0

1/ See table 2, footnote 2.
2/ No information obtained concerning the chopping of hay in these States.
3/ Average of reporting States.

Table 6.- Percentage of hay baled with stationary and pick-up balers, by States, 1939 and 1944 hay crops

State and group	Percentage of 1939 hay production that was baled with 1/			Percentage of 1944 hay production that was baled with 2/			
				Stationary baler			
	Stationary baler	Windrow pick-up baler	Total baled	From windrow or shock	From stacks or barns	Windrow pick-up baler	Total baled
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Maine	1.7	-	1.7	.3	5.2	.6	6.0
New Hampshire	2.7	.3	3.0	.3	2.5	1.9	4.7
Vermont	4.8	-	4.8	.1	1.4	1.1	2.6
Massachusetts	-	-	-	.5	.2	4.7	5.4
Rhode Island	-	-	.4	.9	.4	.8	2.1
Connecticut	.8	-	.8	.4	.8	4.5	5.7
New York	6.7	.3	7.0	2.0	7.1	8.6	17.7
New Jersey	6.4	1.6	8.0	3.6	3.3	29.0	35.9
Pennsylvania	8.4	.6	9.0	2.6	9.2	9.8	21.6
Delaware	5.0	-	5.0	3.9	3.1	19.9	26.9
Maryland	6.6	.4	7.0	2.9	7.8	18.5	29.2
Northeast	5.9	.3	6.2	1.9	6.4	8.4	16.7
Ohio	8.2	.8	9.0	2.7	7.6	20.7	31.0
Indiana	6.3	1.7	8.0	5.2	5.3	30.7	41.2
Illinois	11.9	6.1	18.0	5.9	4.0	38.3	48.2
Iowa	4.0	1.0	5.0	2.4	4.6	22.9	29.9
Missouri	13.8	1.2	15.0	15.9	7.8	16.7	40.4
Corn Belt	8.5	2.2	10.7	6.1	5.7	25.2	37.0
Michigan	4.0	-	4.0	.9	5.0	13.3	19.2
Wisconsin	1.9	.1	2.0	1.0	4.0	7.0	12.0
Minnesota	2.7	.3	3.0	1.2	3.2	7.0	11.4
Lake States	2.7	.1	2.8	1.1	3.9	8.3	13.3
North Dakota	3.5	.1	3.6	.3	.6	.7	1.6
South Dakota	2.3	.1	2.4	.8	2.5	3.0	6.3
Nebraska	4.6	.4	5.0	2.0	4.9	8.7	15.6
Kansas	22.1	1.9	24.0	13.9	4.0	22.1	40.0
Great Plains	6.9	.5	7.4	3.6	3.2	8.2	15.0
West Virginia	4.2	.8	5.0	.5	6.2	.3	7.0
Kentucky	28.5	2.5	31.0	21.2	13.5	12.2	46.9
Tennessee	29.4	1.6	31.0	17.1	15.5	6.3	38.9
Appalachian	24.9	1.8	26.7	15.4	12.8	7.4	35.6
Virginia	8.5	.5	9.0	3.4	10.1	4.6	18.1
North Carolina	35.9	.9	36.8	15.2	15.3	4.4	34.9
South Carolina	34.5	.5	35.0	15.9	20.0	2.6	38.5
Georgia	60.9	.9	61.8	13.8	21.8	4.6	40.2
Florida	49.2	.8	50.0	18.2	32.6	4.0	54.8
Alabama	49.5	.5	50.0	21.6	28.6	2.4	52.6
Southeast	33.8	.7	34.5	11.8	16.6	4.0	32.4
Mississippi	30.0	2.0	32.0	17.9	13.3	8.6	39.8
Louisiana	27.0	2.0	29.0	22.0	10.6	9.5	42.1
Arkansas	41.4	1.6	43.0	29.0	16.3	7.7	53.0
Delta	35.2	1.8	37.0	23.8	14.4	8.3	46.5
Oklahoma	46.5	3.5	50.0	30.2	5.6	30.4	66.2
Texas	48.4	6.6	55.0	42.7	8.8	19.0	70.5
Oklahoma-Texas	47.5	5.1	52.6	35.5	7.0	25.5	68.0
Montana	2.7	.3	3.0	.5	3.7	3.3	7.5
Idaho	1.3	-	1.3	.9	2.0	7.3	10.2
Wyoming	5.8	.2	6.0	.9	4.6	4.0	9.5
Colorado	5.8	.2	6.0	2.3	7.5	3.5	13.3
New Mexico	28.5	8.5	37.0	20.0	14.1	25.7	59.8
Arizona	15.3	29.7	45.0	10.0	4.6	66.7	81.3
Utah	4.2	.8	5.0	2.5	3.8	15.6	21.9
Nevada	8.7	4.3	13.0	2.1	1.7	26.3	30.1
Mountain	5.5	2.4	7.9	2.8	4.6	12.2	19.6
Washington	14.2	.8	15.0	6.6	7.1	9.3	23.0
Oregon	15.4	.6	16.0	8.3	3.8	14.7	26.8
California	26.5	24.5	51.0	23.4	5.6	29.6	58.6
Pacific	21.5	14.3	35.8	16.9	5.5	22.4	44.8
United States	12.0	2.5	14.5	7.1	6.0	13.8	26.9

1/ Includes peanut hay. The data include slight revisions in the figures as originally published in BAE report F. M. 15 "Hand and Machine Methods in Crop Production."

2/ Includes all hay except peanut hay.

Table 7.- Percentage of 1944 hay production stored in barns and stacks, at haying time and sold before storing and the proportion of the production of the 1944 hay crops that was used for grass silage, by States and State groups

State and group	Hay produced in 1944 1/	Percentage of hay produced in 1944 that was: Stored in barns	Stored in stacks	Sold and delivered before storing	Percentage of 1944 crop used for grass silage
	1,000 tons	Percent	Percent	Percent	Percent
Maine	735	97.5	.6	1.9	1.2
New Hampshire	360	94.8	1.8	3.4	1.5
Vermont	992	95.4	2.5	4.1	2.1
Massachusetts	412	94.9	4.6	.5	3.3
Rhode Island	38	96.0	4.0	—	4.6
Connecticut	513	94.3	3.9	1.8	2.8
New York	5,733	90.2	7.0	2.8	1.3
New Jersey	339	89.3	4.1	6.6	2.8
Pennsylvania	5,233	90.3	6.7	3.0	1.7
Delaware	97	80.7	16.3	3.0	3.0
Maryland	489	86.3	10.5	3.2	1.2
Northeast	12,741	91.0	6.1	2.9	1.6
Ohio	3,298	88.9	6.5	4.6	.7
Indiana	2,440	88.3	5.6	6.1	.4
Illinois	3,508	85.4	9.2	7.4	.4
Iowa	5,882	77.0	19.9	3.1	.4
Missouri	3,657	63.0	30.2	6.8	.2
Corn Belt	18,785	79.0	15.7	5.3	.4
Michigan	3,443	90.6	6.9	2.5	.3
Wisconsin	6,736	90.7	7.9	1.4	.9
Minnesota	6,172	60.2	38.3	1.5	.3
Lake States	16,351	79.2	19.1	1.7	.5
North Dakota	3,121	24.7	74.7	.6	.2
South Dakota	3,457	23.0	75.3	1.7	.3
Nebraska	4,902	26.0	70.3	3.7	.2
Kansas	2,767	41.7	46.1	12.2	.3
Great Plains	14,247	28.0	67.8	4.2	.2
West Virginia	823	54.6	44.8	.6	.2
Kentucky	1,623	65.8	29.7	4.5	2/
Tennessee	1,619	76.6	19.5	3.9	2/
Appalachian	4,065	67.8	28.7	3.5	
Virginia	1,291	63.4	34.3	2.3	2/
North Carolina	993	62.2	34.7	3.1	.1
South Carolina	397	65.7	30.6	3.7	2/
Georgia	330	75.6	19.4	5.0	2/
Florida	16	73.9	21.3	4.8	2/
Alabama	520	85.0	10.5	4.5	2/
Southeast	3,547	67.6	29.1	3.3	
Mississippi	1,120	79.9	16.2	3.9	2/
Louisiana	379	76.5	16.7	6.8	2/
Arkansas	1,419	80.3	13.5	6.2	2/
Delta	2,918	79.6	15.0	5.4	
Oklahoma	1,821	56.9	25.1	18.0	2/
Texas	1,351	50.0	34.0	16.0	2/
Oklahoma-Texas	3,172	54.0	28.9	17.1	
Montana	2,433	12.5	85.8	1.7	.2
Idaho	2,293	19.9	75.0	5.1	.1
Wyoming	1,086	3.9	94.4	1.7	—
Colorado	2,279	8.2	84.7	7.1	.2
New Mexico	478	22.8	55.1	22.1	.2
Arizona	785	35.0	27.9	37.1	—
Utah	1,234	23.6	64.5	11.9	—
Nevada	611	.7	97.7	1.6	—
Mountain	11,199	14.9	77.1	8.0	.1
Washington	1,966	68.1	23.2	8.7	1.3
Oregon	1,862	65.5	24.0	10.5	1.2
California	5,588	51.0	17.4	31.6	.5
Pacific	9,416	57.4	19.9	22.7	.8
United States	96,441	61.8	31.7	6.5	3/ .5

1/ See table 3, footnote 2.
2/ Information not obtained in these States.
3/ Average of reporting States.

The most marked increase in baling was in the Corn Belt where less than 11 percent of the crop was baled in 1939 and about 37 percent in 1944. In the Northeastern and Mountain States increases in baling from 1939 to 1944 were above the average.

Practically all of the increase from 1939 to 1944 resulted from the increased use of windrow pick-up balers. The number of such balers on farms more than trebled during the period and there was also an increase in annual use per baler. Windrow pick-up balers were used for baling only about 2.5 percent of the 1939 crop and about 14 percent of the 1944 crop. These balers were used fairly extensively in 1939 in the Southwestern portion of the country only.

About 13 percent of the 1944 hay crop was baled with stationary balers, compared with 12 percent in 1939. Use of stationary balers was relatively most important in the Southern and Appalachian States but from 1939 to 1944 their use increased somewhat in most States.

Of the hay baled with stationary balers about 55 percent was baled before storing and the remainder baled after storing in stacks or barns. More than half of the hay baled with stationary balers in the Northeastern States, the Southeastern States, the Lake States, and the Mountain States was baled from barns or stacks. Baling with stationary balers at haying time from the windrow or shock was relatively most important in Oklahoma and Texas and in the Pacific Coast States, especially California.

STORING

About 62 percent of the 1944 hay crop was stored in barns at haying time. This method of storing accounted for more than 90 percent of the crop in New England, New York, Pennsylvania, Michigan, and Wisconsin, and was above average in all States east of the Mississippi River except West Virginia (table 7). In the more humid areas of the Pacific Coast States a high percentage of the crop was stored in barns (fig. 4).

Storing of hay in stacks was the predominant method in the semi-arid areas and irrigated valleys of the West. Little hay is stacked in most Eastern areas but the percentage is relatively high in southwestern Virginia, western North Carolina, and parts of West Virginia, Kentucky and Tennessee (fig. 5).

Less than 7 percent of the 1944 crop was sold and delivered at haying time, before being stored. Selling hay at haying time was much above the average for the country in California, Arizona, New Mexico, Oklahoma, and Texas, where a high percentage of the crop was baled at haying time.

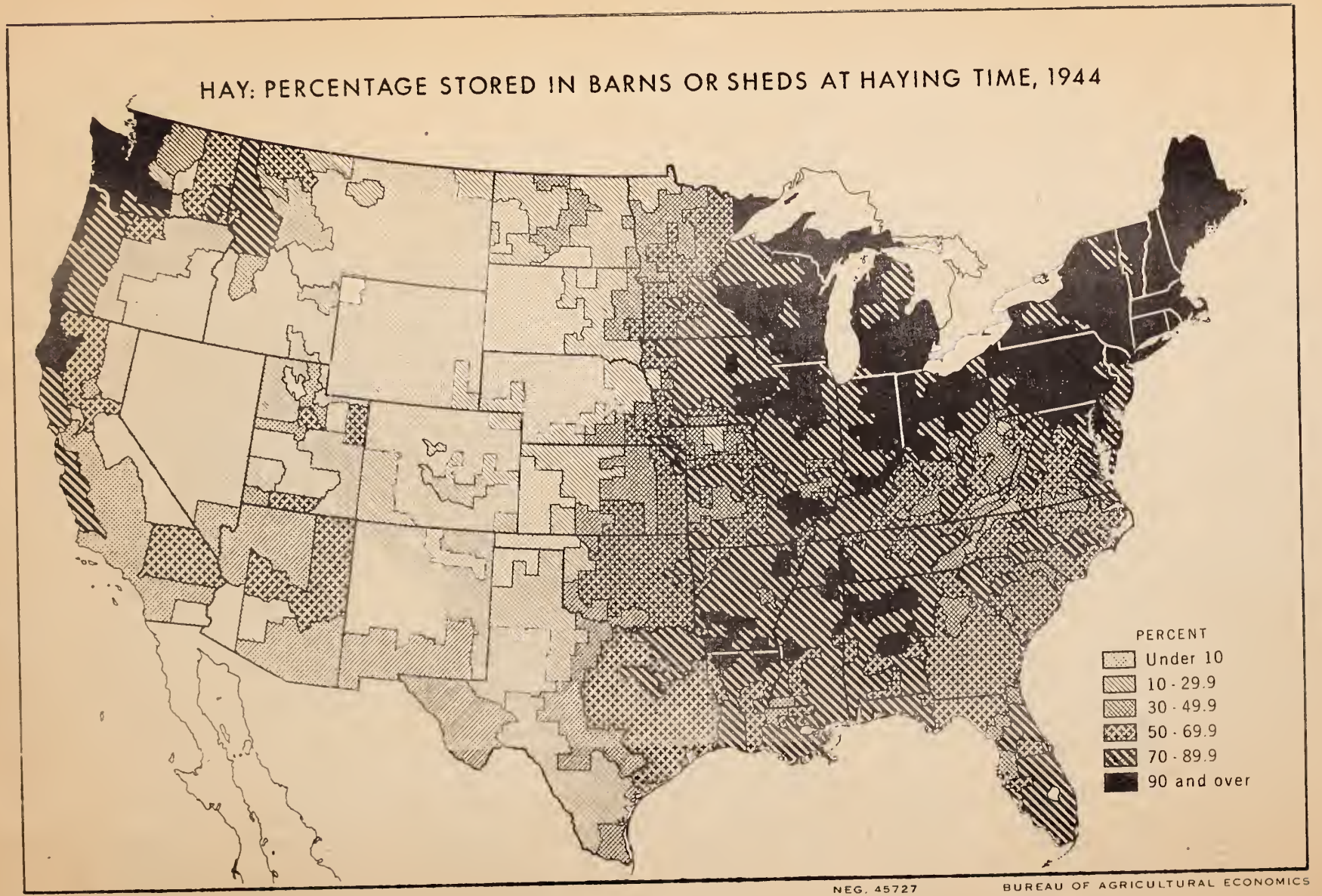
HAY: PERCENTAGE STORED IN BARNS OR SHEDS AT HAYING TIME, 1944
PERCENT
Under 10
10 - 29.9
30 - 49.9
50 - 69.9
70 - 89.9
90 and over
U. S. DEPARTMENT OF AGRICULTURE
NEG. 45727
BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 4

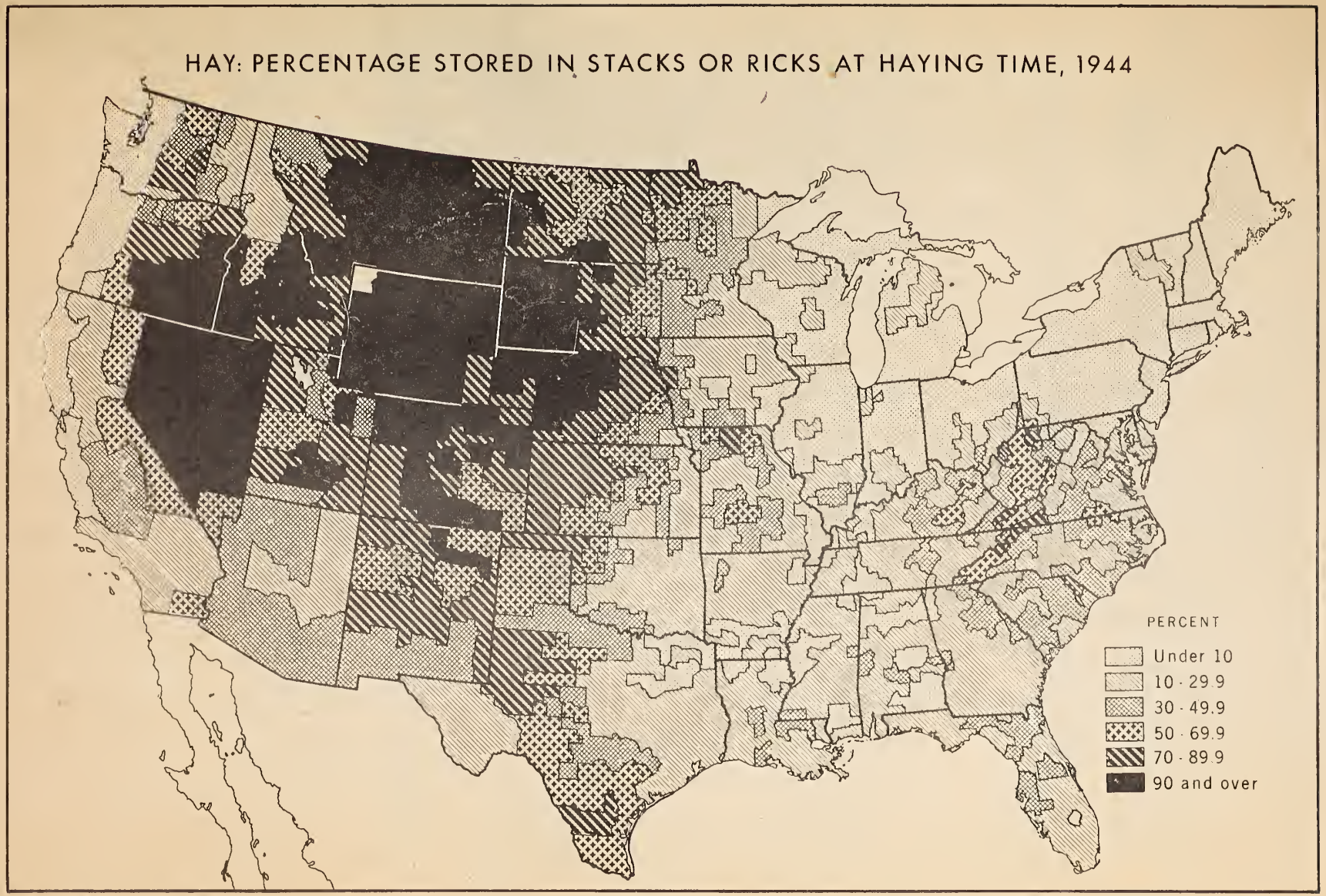
HAY: PERCENTAGE STORED IN STACKS OR RICKS AT HAYING TIME, 1944
PERCENT
Under 10
10 - 29.9
30 - 49.9
50 - 69.9
70 - 89.9
90 and over
U. S. DEPARTMENT OF AGRICULTURE
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FIGURE 5

GRASS SILAGE

About one-half of 1 percent of the production of hay crops in States reporting in 1944 was used for grass silage according to the reports of the crop correspondents. Use of hay crops for silage was most important in the Northeastern States, Pacific Coast States, Wisconsin, and Ohio (table 7).

The production of silage from hay crops is above average in areas where dairy production is important and the annual rainfall is high.

CURING

Adverse weather conditions at haying time have always resulted in losses in quality and quantity of hay. For years there has been interest in developing better methods of curing hay; this interest has increased with the development of new methods of barn curing. Expansion in farm electrification, high prices for feed, and shortages of feed, have also stimulated interest in barn curing.

Information from crop correspondents concerning the quantity of hay cured on farms by barn dryers was not obtained from most Southern and Appalachian States but was obtained from all Northern, Central and Western States. These reports indicate that about 125,000 tons of hay were cured on farms by barn curing methods in the reporting States in 1944 (table 8). Reports from other sources indicate that in the calendar year 1944 production of alfalfa meal from dehydrated hay reached about 347,000 tons. Small quantities of hay other than alfalfa are also handled by the commercial dehydrating plants.

Data from other sources indicate that during the 7-month period, June 1 to December 31, 1945, the production of alfalfa meal from dehydrated hay was more than 20 percent greater than for the same period a year earlier.

Production of alfalfa meal from dehydrated hay was most important in the Great Plains, the Mountain States, and the Corn Belt. Of the States supplying information, farm production of barn cured hay in 1944 was most important in the Pacific Coast and Northeast States.

Table 8.- Estimated quantity of hay cured by artificial methods on farms, and production of dehydrated alfalfa meal, State groups, calendar year, 1944

State group	Estimated amount of hay cured artificially on farms	Production of alfalfa meal from dehydrated alfalfa hay 1/
	1,000 tons	1,000 tons
Northeast	32	22
Corn Belt	13	74
Lake States	15	4
Great Plains	6	113
Appalachian	2/	1
Southeast	3/	-
Delta	4/	21
Oklahoma-Texas	4/	8
Mountain	1	79
Pacific	46	25
United States	5/ 125	347

1/ Adapted from reports of the grain branch, P.M.A., U. S. Dept. of Agr. Small quantities of hay other than alfalfa are produced by commercial plants in some areas.

2/ Estimates obtained only in West Virginia.

3/ Estimates obtained only in North Carolina.

4/ No estimates obtained in these States.

5/ Includes estimates of hay cured artificially in North Carolina and West Virginia.

Table 9.- Percentage of hay crop handled by specified harvest methods, State groups and U. S., 1944

Harvest method	United States	North-east	Corn Belt	Lake States	Great Plains	Appa-lachian	South-east	Delta	Okla.-Texas	Mountain	Pacific
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Cut with											
Tractor mowers	42.0	56.0	42.0	30.0	50.0	14.0	19.0	21.0	68.0	54.0	66.0
Horse mowers	58.0	64.0	58.0	70.0	50.0	86.0	81.0	79.0	32.0	46.0	34.0
Raked with											
Tractor rake	30.0	30.0	35.0	25.0	26.0	7.0	8.0	11.0	51.0	29.0	51.0
Horse rake	70.0	70.0	65.0	75.0	74.0	93.0	92.0	89.0	49.0	71.0	49.0
Baled											
With windrow pick-up baler	13.8	8.4	25.2	8.3	8.2	7.4	4.0	8.3	25.5	12.2	22.4
With stationary baler	13.1	8.3	11.8	5.0	6.8	28.2	28.4	38.2	42.5	7.4	22.4
Not baled	73.1	83.3	63.0	86.7	85.0	64.4	67.6	53.5	32.0	80.4	55.2
Hauled at harvest by											
Horse buck rakes	10.2	1.0	5.5	6.7	28.5	3.7	4.3	7.1	7.4	20.9	4.3
Auto or tractor buck rakes	12.2	2.8	8.2	8.0	32.6	.9	1.7	3.3	7.0	24.4	8.2
Horse-drawn wagons	44.8	53.8	47.5	53.2	22.9	82.8	79.0	71.8	26.9	34.1	27.7
Tractor-drawn wagons	19.4	23.8	30.9	27.1	9.6	5.6	6.4	6.8	24.1	9.6	16.7
Motortrucks	13.4	18.6	7.9	5.0	6.4	7.0	8.6	11.0	34.6	11.0	43.1
Hay loading											
By hand	45.0	41.4	56.2	22.2	29.6	90.7	88.4	86.2	82.1	46.5	66.5
With hay loader	32.6	54.8	30.1	65.1	9.3	4.7	5.6	2.7	3.5	8.2	21.0
With buck and other rakes	22.4	3.8	13.7	14.7	61.1	4.6	6.0	10.4	14.4	45.3	12.5
Hay unloading											
By hand	25.3	18.3	13.8	9.4	17.1	66.8	77.1	78.0	76.1	21.3	33.3
With power forks, slings, stackers, etc., 1/	74.3	81.7	86.2	90.6	82.9	33.2	22.9	22.0	23.9	78.7	66.7
Stored in barns or sheds	61.8	91.0	79.0	79.2	28.0	67.8	67.6	79.6	54.0	14.9	57.4
Stored in stacks or ricks	31.7	6.1	15.7	19.1	67.8	28.7	29.1	15.0	28.9	77.1	19.9
Sold and delivered before storing	6.5	2.9	5.3	1.7	4.2	3.5	3.3	5.4	17.1	8.0	22.7
Chopped before storing	2/2.0	1.1	1.3	1.0	.8	—	—	—	—	2.9	8.1
Used for grass silage	3/ .5	1.6	.4	.5	.2	—	—	—	—	.1	.8

1/ Includes all hay moved to stacks or barns with buck rakes.
2/ See footnote 3, table 5.
3/ See footnote 3, table 7.